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The purpose of this study is to examine the notion of a general structure in child development as seen through consistency in level of the child's response from task to task. It is hypothesized, first, that a child will show an internal orientation if he is in the final stage of development (object relevance); and second, that he will show an external orientation if he is at the first stage (egocentrism). Responses to three types of tasks (moral and causal judgments, and general reasoning) were recorded for 28 boys from grades three, four, and five. Results supported the first hypothesis. Subjects who scored at the high level in general reasoning also scored at the same high level in moral and causal judgment tasks. But subjects scoring low on general reasoning tasks were inconsistent in their level of responses to the other two tasks. Thus, the second hypothesis was not confirmed. Where each task was compared with age, significant results were yielded only for the moral judgment task. Here the older group of boys had significantly higher scores than the younger group. Comparison of the relationship between tasks shows only the relationship between general reasoning and causal judgment to be significant. (JF)

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A COMPARISON OF RELATIVE STRUCTURAL LEVELS ON A VARIETY OF COGNITIVE TASKS

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General stages of conceptual development are common to Piaget's theories of developmental stages from birth to maturity in the areas of moral and causal judgments. The first of the three stages is sensori-motor intelligence during which the child is stimulus bound and his responses are simple perceptual and motor adjustments to things rather than symbolic manipulation of them. At this level the child confuses his own activities with those of the external world. Stage two begins with the formation of symbols for objects and ends with more rational understanding of the organization of objects (Stuart, 1967). While the child has acquired a sense of relations among objects, the understanding is confined to the level of concrete thought. The capacity for logical thought is developed during the third stage. The relationship between objects can be understood in terms of their formal properti The child views the world in less immediate, propositional terms. Thus the early stage is dominated by an egocentric state in which the child is unable to differentiate between ego and external reality. A transitional period occurs between the egocentric phase and the object-relevant phase. In the later stage a reorientation takes place which enables the child to relate objects to his own viewpoint and to distinguish it from the viewpoint of others.

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A child who has attained this level of formal thought is capable of solving a formal reasoning task perfectly (Hlorf, 1957).

In the development of causal thought as illustrated by the child's concept of the dream one is able to see this movement from the egocentered to object-relevant phase. During the egocentric phase of the stages of concrete operations (the stages of precausal thought), children have complete belief in the reality of dreams. The lack of differentiation between dreaming and reality is observable in that if the content of the dream includes people, it is made of "skin"; if it involves objects, or it is seen on the wall, it is made of "wood"; and so forth. While the child knows that the dream is illusive and does not confuse it with real objects and persons, he nevertheless remains essentially realistic since he does not yet recognize any subjective element. Dreams remain external and are in no sense mental (Piaget, 1965). A transitional period between the egocentric and object-relevant phases is identified by Laurendeau and Pinard (1962). This stage of mitigated realism represents a bridge between interiorization and externalization of the phenomenon and there is a continuous oscillation between the phases. Some children alternately give an external and internal origin to the concept of the dream. During the final phase of object relevance, all traces of realism and other forms of precausal thinking have disappeared. The "perfect" explanation is given by children in the phase, that is, the origin of the dream and its course are interiorized. Dreams are internal and of internal origin (Piaget, 1965).

In the movement toward more mature moral judgment a reverse process seems to occur. While development of causal judgment and general reasoning seems to progress from subjective to objective orientation, moral judgments move from

objective to subjective orientation. The early stages of moral development are characterized by moral realism and objectivity. Moral judgment is based upon behavioral outcomes or consequences which are externally enforced (heteronomy). Egocentrism is seen in the fact that the child plays for himself. His play is individualistic in manner although the material (game) is of a social nature (Piaget, 1965). The transitional period which occurs after the first phase is reflected by the presence of cooperation, but this cooperation exists only in intention. The desire to cooperate is still purely personal " . . . of feeling himself to be a member of a mystical community whose sacred institutions are handed down by elders out of the remote past." (Piaget, 1965) During the later stage, morality is characterized by a relativistic and subjective liberal judgment based upon mitigating circumstances and awareness of the importance of intent or motive. The child's orientation is internal, and in this final stage the child has thoroughly mastered the codes for the game and derives pleasure from changing the rules if there is mutual consent (autonomy).

Thus it is that while the child's development progresses from subjective to objective causal judgments and in the same direction in general reasoning and from objective to subjective moral judgments, he nevertheless moves from the egocentric to the object-relevant phase in all three areas of development. This common movement from an external to an internal orientation seems to indicate a change in developmental structures, that is to say, each phase represents a general underlying structure. Kohlberg (1958) states that because stages (phases) are ideal-typical abstractions, they cannot be descriptive of all behavior of all children at all of the specified ages. It seems worthwhile, however, to examine the consistency of the level of response from object to

object or task to task. The child's response should demonstrate the same relative structural level in a variety tasks if the response represents a general structure rather than a specific learning.

Stuart (1967) has found that the ability to decenter correlates significantly with the ability to make mature moral and causal judgments. For Piaget the role of decentration is an important one in the acquisition of more complex cognitive capabilities. Stuart also observed that decentration and mature judgment correlate with age and intelligence.

The child's representation of reality moves from subjectivity to objectivity in causal judgments and from objectivity to subjectivity in moral judgments. The progress in general reasoning is in the same direction as in causal judgments. This movement from an external orientation to an internal one seems to be representative of the development of the child in all three areas. If the child's responses represent a general structure rather than a specific learning, then a child should demonstrate the same relative structural level in a variety of tasks. Thus if egocentrism (external orientation) and object-relevance (internal orientation) represent different developmental structures (structural levels), then the child should show an external orientation in his responses to a variety tasks if he is at the first stage of development and similarly if he is in the final stage, his responses to tasks would demonstrate an internal orientation. Accordingly, it is hypothesized that there will be consistency in the level of responses to tasks which are varied in nature. The hypotheses are:

1. That a child scoring at the high level of general reasoning has an internal orientation and will score at the same level in moral and causal judgments

(thus there will be manifested consistency in level of response in terms of this internal orientation) and that

2. A child scoring at the low level of general reasoning has an external orientation and will score at the same level in moral and causal judgments (thus there will be manifested consistency in level of response in terms of this external orientation).

METHOD

Research Plan

The purpose of this study is to examine the notion of a general structure as evidenced by consistency in level of the child's response from task to task. Hopefully such knowledge would be of value in suggesting approaches to the teaching techniques which might be desirable for use with children possessing a specific type of general structure. Moral and causal judgments and general reasoning tasks were studied to determine whether or not there is a same relative structural level of response from task to task. Three separate instruments were used in individual interviews with school children. The instruments were scored to identify the level of development for all three tasks. The criterion task was Morf's (1957) general reasoning task. Then each of the subjects was asked to perform the other two tasks, moral and causal judgment. A comparison was made of each child's relative structural level in the three areas of development.

Subjects

Responses to the three types of tasks were recorded for twenty-eight boys from grades three, four, and five in a public elementary school which is located in a middle-class, surburban community. Most of the children were of slightly above average intelligence with a mean IQ of 115.7 for the total group. The age range

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was 8 years, 3 months to 11 years, 7 months with a mean age of 9 years, 2 months.

General Reasoning Task (GRT)

The GRT was a story in the form of a riddle whose solution is resolvable only by those who have attained formal reasoning (Morf, 1957). The riddle used was:

> I think of an animal. If the animal has long ears, it may be either a donkey or a mule. If my animal has a big tail, it is either a mule or a horse. Now, I want an animal with both long ears and a big tail. What can it be?

The riddle was read to S as many times as he needed until it was observed that he had assimilated its content well enough. Then S repeated the story to E who made necessary corrections until S showed knowledge of all of the data. Each time that S seemed uncertain of the data of the problem or when E suspected that a deformation had occurred, E repeated the riddle. All interview sessions were tape recorded. The response of S was scored in terms of correct or incorrect answer, that is, in terms of high or low (internal or external) structural level.

Moral Judgment Task (MJT)

Piaget's (1948) items for the rules of the games of marbles were used in questionnaire form to determine the level of moral judgment for each S. The items are concerned generally with two areas: the practice of rules and the consciousness of rules. In the first instance each S was asked if he knew how to play the game marbles and was then engaged in a game with E following the rules as outlined by S. To find out about the S's consciousness of rules, S was asked about whether or not rules can be changed and about the origin of rules. The response of S was scored in terms of high or low structural level (internal or external orientation).

Causal Judgment Task (CJT)

The modified Piagetian task as developed by Laurendeau and Pinard (1962) was used in this study to measure level of causal judgment. This task consisted of a questionnaire that is designed to differentiate levels of causal judgment as evidenced by the subject's concept of the dream. The analysis is concerned with responses to questions about six areas: the origin of the dream, the location of the dream, the organ of dreams, the cause of dreams, the substance of dreams, and the reality of dreams. Each S was asked questions which dealt with these areas. An attempt was made by E to make sure S understood the questions. When necessary, the wording of the questions was changed, using terms which were more familiar to the child. Care was taken to avoid suggesting more than was included in the instructions. All answers were tape recorded, and responses were classified as high or low in terms of structural levels, that is, in terms of internal or external orientation.

RESULTS

To test the hypotheses that children would demonstrate the same relative structural level on the GRT as on a variety of tasks (MJT and CJT), the responses of Ss on the three tasks were scored high or low and then compared.

Chi square analysis of the data revealed significant differences between the scores of high and low GRT Ss on the CJT and MJT ($X^2 = 12.403$ with df of 2, $p < .01$). High GRT Ss tended to score at the same high level on CJT and MJT supporting hypothesis 1. Low GRT Ss, however, scored at different levels on the CJT and MJT. Thus support was not given to hypothesis 2.

Other Analyses

A Chi square analysis indicated a significant difference between age groups with regard to the homogeneity of levels of responses for the three tasks (x^2 = 3.047 with df of 1, $p < .05$, one-tailed test). A consistency of level of responses was exhibited by the older group (10 - 11 years) of Ss on the three tasks; 70% of the older Ss had perfect solutions on all of the tasks. Only 27% of the younger Ss (8 - 11 years) had this consistency of perfect solutions.

Chi square analyses were also carried out on the relationship of age and response to general reasoning task, age and response level of moral judgment task, age and level of causal judgment. These analyses indicated no significant differences between age groups and level of general reasoning (x^2 = .67, N.S.) nor between age groups and causal judgment response level (x^2 = 1.038 with df of 1, $p < .15$, one-tailed test). Moral judgment seems to be significantly related to age (x^2 = 3.76 with df of 1, $p < .05$, one-tailed test).

The McNemar test for significance was used because the study uses two related samples and uses nominal measurement (Siegel, 1957). The analyses indicate significance between the general reasoning task and the causal judgment task (x^2 = 4.3 with df of 1, $p < .025$, one-tailed test). No significant relationship was found between general reasoning and moral judgment (x^2 = .1 with df of 1, $p < .4$, one-tailed test). Analysis of the relationship between causal judgment and moral judgment also yielded no significant results (x^2 = .8 with df of 1, $p < .25$, one-tailed test).

Chi square analyses of the relationship between IQ and general reasoning (x^2 = .58, N.S.) and between IQ and moral judgment (x^2 = .49, N.S.) indicate that they are not related significantly. No test was available to use in the analysis of the relationship between IQ and causal judgment. IQ was not significantly related to homogeneity of level of response (x^2 = .7 with df of 1, $p < .25$, one-tailed test).

DISCUSSION

Hypothesis I was supported by the results of the study. Subjects who scored at the high level in general reasoning also scored at the same high level in moral and causal judgment tasks. Thus there was manifested a consistency in level of response which was internally oriented for these subjects for all three tasks.

These results are explainable within the framework of Piaget's theory. He observes that the child of 7 to 10 plays as he reasons. The child must be able to reason formally; that is,he must have a conscious realization of the rules of reasoning which enable him to apply them to any case whatsoever, including purely hypothetical cases. The child in his early years does not distinguish the part played by his subjectivity from that played by the environmental pressure. As he grows older and the prestige of older children and adults diminishes, there is discussion with them. In other words, Piaget says that there is increased opportunity (beyond the scope of suggestion, obedience, or negativism) of freely contrasting his point of view with others. "He discovers the boundaries which separate self from others and learns to understand the other person and be understood by him" (Piaget, 1948, p. 94).

Piaget further states that "egocentrism in so far as it means confusion of the ego and the external world, and egocentrism in so far as it means lack of cooperation, constitute one and the same phenomenon" (Piaget, 1948, p. 93). The causal judgment task seems to be attainable at a much earlier age than the general reasoning or moral judgment tasks. Perhaps a different type of causal judgment task other than the concept of the dream would be of more use in testing the hypothesis.

While it seems feasible on the basis of the data from this study to conclude that there is consistency in level of response to various tasks if the level of general reasoning is high, no support is available when low general reasoning scores are used as predictors of level of response for the other tasks. The heterogeneity in level of responses for these Ss on the other two tasks does not lend support to the hypothesis (2).

The lack of significance for hypothesis 2 might be attributable to the small sample size or to some artifact introduced by the causal judgment task. This task, as tested by the subject's concept of the dream, seemed to be too easy as compared with the other two tasks used in this study. This implies that the mean age of attainment of the concept is earlier for the causal judgment task than for the other tasks. The trend which is suggested by the data is that there is a common element for general reasoning and moral judgment which might allow for the prediction of one by using the other. This statement cannot be said of causal judgment. While it might contain an element common to the other two tasks, the causal judgment task would not be a useful predictor of the levels of the general reasoning nor for the moral judgment task.

Some additional comparisons of the data were made although they were not a part of the original hypotheses. However, predictions of their outcomes were made prior to the analysis of the data. There is evidence from these results to indicate the desirability of testing these comparisons as hypotheses, and they are reported here with the suggestion that they be tested in some future study.

One such comparison was the relationship between age groups and the consistency of their scores at the high level of response on three tasks. In this study it was found that a significantly greater percent of the older group of subjects maintained this consistency at high level than did the younger group.

This trend is predicted by Hoffman (1963) who suggests that there is little behavioral generality and little dynamic consistency in early childhood, but both tend to increase with age. In early childhood there is an absence of ability to discriminate relevant cues and anticipate consequences. Offering some support to this result as observed in this experiment is a study by Stone and Ausubel (1967) in which they found that there was increasing generality of cognitive functioning across the various subject matter areas of a school curriculum with increase in age. They conclude that situational generality is a reasonable expectation "after a certain level of ideational experience in a number of subject matter areas and relevant intellectual capacities have been acquired." A study by Uzgiris (1964) also found that situational specificity rather than situational generality is characteristic of newly emergent behavior when the degree of variation of the subject's performance across tasks involving Piagetian concepts of conservation of mass, weight and volume were tested in relation to the length of time that the ideas had been part of the cognitive structure.

The analysis of the data comparing each task with age yielded significant results for only age and the moral judgment task. It was found that the older group of boys had significantly higher scores on the task that did the younger one. Investigators of this relationship between moral responses and age have reported results that are consistent with this finding, that is, that more mature moral responses occurred with increasing age. "In general, previous findings report age to be the only consistently operative factor in the development toward maturity of moral judgment" (Boehm and Nass, 1962, p. 566).

Comparison of the relationship between tasks shows only the relationship between general reasoning and causal judgment to be significant. While the result of this comparison is significant, the relationship between these tasks is difficult to assess. A possible reason for this difficulty is that the concept of the dream (causal judgment task) seemed attainable for nearly all of the population of this study. That is to say, the level of response was heavily weighted toward an internal orientation for all subjects.

No significance was found when a comparison was made between IQ and level of moral judgment. This result was not surprising since most studies thus far report contradictory findings for the relationship between moral judgment and age (Boehm and Nass, 1962). IQ was not significantly related to either the general reasoning or the causal judgment task.

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